

## **A NEW HCL COLOR SPACE WITH ASSOCIATED COLOR SIMILARITY MEASURE FOR COLOR-BASED IMAGE RETRIEVAL**

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### **Abstract**

Color analysis is frequently used in image/video retrieval. However, many existing color spaces and color distances fail to capture correctly color differences usually perceived by the human eye. The objective of this paper is first to highlight the limitations of existing color spaces and similarity measures in representing human perception of colors, and then to propose (i) a new perceptual color space model called HCL, and (ii) an associated color similarity measure denoted  $D_{HCL}$ . Experimental results show that using  $D_{HCL}$  on the new color space leads to a solution very close to human perception of colors and hence to a potentially more effective content-based image/video retrieval. Moreover, the application of the similarity measure  $D_{HCL}$  to other spaces like HSV leads to a better retrieval effectiveness. A comparison of HCL against  $L^*C^*H$  and CIECAM02 spaces using color histograms and a similarity distance based on Dirichlet distribution illustrates the good performance of HCL for a collection of 3500 images of different kinds.

**Key words :** HCL color space, color analysis